

Office Action Summary

Application No.

10/710,890

Applicant(s)

LIU ET AL.

Examiner

STEPHEN R. KOZIOL

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 7-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites, inter alia, "(c) calculating an FD of the portion of the image signal; and (d) adjusting the distance between the lens and the optical sensor according to the FD." The specification does not explicitly define what exactly an "FD" is. This results in a lack of clarity that renders Claim 7 indefinite for failing to particularly point out and distinctly claim this particular aspect of the claim.

Claims 8-10 are similarly rejected for their dependence on Claim 7.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims (7 and 9) are rejected under 35 U.S.C. 102(b) as being anticipated by Hanabusa et al., hereinafter Hanabusa, U.S. Pre-Grant Publication 2002/0145752 A1.

Regarding claim 7 Hanabusa teaches a method of packaging an optical sensing module including a lens and an optical sensor, comprising:

- (a) receiving an image signal from the optical sensor; (*see par. 0143, where the input image is received*)
- (b) extracting a portion of the image signal; (*see par. 0280, where a portion of the received input image signal is extracted*)
- (c) calculating an FD of the portion of the image signal; (*see par. 0143, where calculating a distance between a lens and optical sensor is performed during the described "focusing" process as further indicated in par. 0184*)
- (d) adjusting the distance between the lens and the optical sensor according to the FD (*see par. 0184 where "focusing" further adjusting the distance between the lens and the optical sensor*); and
- (e) packaging the lens and optical sensor into an integral part (*see par. 0184 where the lens and optical sensor are an integral part*).

Regarding claim 9 Hanabusa teaches the method of claim 7 wherein in step (d) adjusting the distance between the lens and the optical sensor involves adjusting the distance in a convergent way (*see par. 0184 where "focusing" further adjusting the distance between the lens and the optical sensor in a convergent way*).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Venkat et al. U.S. 6,462,330 B1, hereinafter Venkat, in view of Nakayama et al. U.S. 6,148,097 A1, hereinafter Nakayama.

Regarding claim 1 Venkat teaches an automatic-packaging apparatus for packaging an optical sensing module including a lens and an optical sensor (*Venkat, Figs. 3-6, col. 3 lines 20-30*), comprising:

- a) a base for supporting the lens and the optical sensor, comprising an adjustment device for adjusting the distance between the lens and the optical sensor (*Venkat, where the base is shown in Fig. 3 item 48, and the adjustment device is shown in Fig. 4 item 50 as described in col. 3 lines 25-30*);
- b) a distance-adjusting module, coupled to the base and the image-analyzing module, for controlling the adjustment device to adjust the distance between the lens and the optical sensor (*Venkat, col. 3 lines 25-37, where the position of the lens is adjusted to achieve optimal distance between the lens and the optical sensor*); and
- c) a packaging module for packaging the lens and the optical sensor into an integral part (*Venkat, col. 3 lines 48-53, where the lens and optical sensor form an integral part*).

Venkat is silent on an image-analyzing module for analyzing an image signal received from the optical sensor and outputting an analyzed result used to adjust the distance between the lens and the optical sensor. However, Nakayama cures the aforementioned deficiencies of Venkat by teaching an image-analyzing module in the same endeavor that analyzes an image signal received from the optical sensor and outputs an analyzed result (*see Nakayama, col. 44 lines 33-64*). Therefore, it would have been obvious to a person having ordinary skill in the image processing arts at the time of the invention to modify Venkat's lens and sensor assembly to include the image-analyzing module as taught by Nakayama for the benefit of achieving a more robust distance-adjusting model that utilizes the result of the image-analyzing module.

Regarding claim 3 Nakayama teaches the automatic-packaging apparatus in claim 1 wherein the image-analyzing module is used to determine whether there are stains or broken points on the lens or on the optical sensor according to the image signal (*see Nakayama, col. 44 lines 33-64*).

Regarding claim 4 Nakayama teaches the automatic-packaging apparatus in claim 1 further comprising a stain-detecting module which is coupled to the base for determining whether there are stains or broken points on any one of the lens and on the optical sensor according to the image signal and a predetermined standard image (*see Nakayama, col. 44 lines 33-64*).

Regarding claim 5 Nakayama teaches the automatic-packaging apparatus in claim 4, wherein the stain-detecting module comprises a memory to store the predetermined standard image (*see Nakayama, col. 44 lines 33-64*).

Regarding claim 6 Nakayama teaches the automatic-packaging apparatus in claim 1 further comprising a memory built in the image-analyzing module for storing the image signal (*see Nakayama, col. 44 lines 33-64*).

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Venkat et al. U.S. 6,462,330 B1, in view of Nakayama et al. U.S. 6,148,097 A1, further in view of Choo, U.S. Pre-Grant Publication 2004/0017500 A1, hereinafter, Choo.

Regarding claim 2, Venkat in view of Nakayama teach the automatic-packaging apparatus in claim 1, as indicated re claim 1 supra, but both Venkat and Nakayama fail to disclose the apparatus wherein the distance-adjusting module comprises a motor. However, Choo cures the aforementioned deficiencies of Venkat and Nakayama by teaching an image-analyzing module in the same endeavor that includes a motor to adjust the lens distance with respect to the image sensor (*see Choo pars. 0033 thru 0035*).

Therefore, it would have been obvious to a person having ordinary skill in the image processing arts at the time of the invention to modify Venkat in view of Nakayama's lens and sensor assembly to include the distance-adjusting motor as taught by Choo for the benefit of achieving a more automated distance-adjusting model that utilizes a motor to adjust the distance between the lens and optical sensor.

9. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanabusa et al. U.S. Pre-Grant Publication 2002/0145752 A1.

Regarding claim 8 Hanabusa teaches the method of claim 7 but fails to further teach that calculating the FD comprises the steps: (c1) in the portion of the image signal, obtaining a square of a horizontal deviation $Gx_{sup.2}$, wherein $Gx=g(x,y)-g(x+1,y)$; (c2) in the portion of the image signal, obtaining a square of a vertical deviation $Gy_{sup.2}$, wherein $Gy=g(x,y)-g(x,y+1)$; and (c3) calculating $Gx_{sup.2}+Gy_{sup.2}$ and then obtaining the FD. However Official Notice is taken to note that the concept and benefit of using both horizontal and vertical deviation values

Art Unit: 2624

(and their squares or sums) to determine a distance value between a lens and sensor is well known and expected in the art and therefore would have been obvious to incorporate into the lens defect detection method of Hanabusa for the benefit of a more accurate distance calculation utilizing the horizontal and vertical deviations of a portion of the input signal.

Regarding claim 10 Hanabusa teaches the method of claim 7 but fails to further teach adjusting the distance between the lens and the optical sensor desires to determine the distance rendering the maximum value of FD. However Official Notice is taken to note that the concept and benefit of using a maximum distance value between a lens and sensor is well known and expected in the art and therefore would have been obvious to incorporate into the lens defect detection method of Hanabusa for the benefit of a more accurate distance calculation.

Contact

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steve Koziol whose telephone number is (571) 270-1844. The examiner can normally be reached on Monday - Friday 8:30 - 5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached at (571) 272-7413 . Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-7332.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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